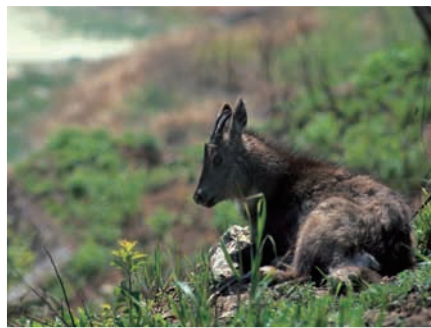


# Korea's National Biodiversity Strategy 2014-2018



Republic of Korea

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### Front cover photos

(From left to right) Morning in Hapcheonho in Gyeongsangnam-do Province by Ui Ryong Hong, Morning in Upo swamp in Gyeongsangnam-do Province by Yoon Kwon Lee, *Nemorhaedus goral* in Mt. Seoraksan by Nak Min Choi, Mud flat in Jeollabuk-do Province by Byung Hwan Kim, Colony of *Cyripedium japonicum* in Mt. Deokysan by Hae Bok Lee, Asiatic black bear in Mt. Jirisan by Species Restoration Technology Institute, *Suaeda japonica* in Suncheon Bay, Jeollanam-do Province by Jae Choon Lee

### Back cover photos

(From left to right) *Anas platyrhynchos*, Sunset at Solseom Island of Byeonsan, Jeollabuk-do Province by Young An Kim, Cheonwangbong Peak of Mt. Jirisan in autumn color by Gil Ho Kim, *Pinus koraiensis* germination in Mt. Sobaeksan by Kyoung Soon Jeong, *Falco tinnunculus* in Mt. Jirisan by Hong Cheon Ha, Starry night in Mt. Halla by Hong Young Yeon, Spring valley of Mt. Jirisan by Sang Ho Ban, *Marasmius pulcherripes* in Mt. Odaesan by Jeon Geun Lee, *Erinaceus amurensis koreensis* in Mt. Chiaksan by Gwan Young Choi

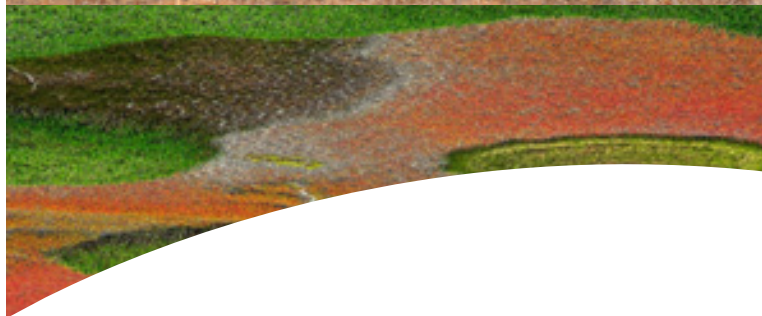


Korea's National  
Biodiversity  
Strategy  
2014-2018

Ministry of Environment  
Republic of Korea



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# INTRODUCTION

The 3rd Korea's National Biodiversity Strategy and Action Plans for 2014-2018 is a comprehensive framework for achieving the nation's goals to conserve the biodiversity of Korea for coming 5 years. The conservation of biodiversity through the sustainable use of biological resources is the main biodiversity strategy in Korea to comply the Convention on Biological Diversity. The main theme of the 3rd Korea's NBSAP is 'Expanding the Future Value of Biodiversity.'

## Previous NBSAPs

According to the obligation under articles 6 and 26 of the Convention, Korea had established NBSAPs over two occasions in the past. Korea finalized the 1st NBSAP by the Cabinet Council in 1997, which was submitted to the CBD COP4 in 1998. The 1st NBSAP focused on the conservation of biodiversity, sustainable use of biological resources, capacity building and enhancing management practices.

In October 2008, the Task Force on Biodiversity was established for the purpose of drawing up the National Biodiversity Strategy and compiling the National Report, and the formulation of the 2nd National Biodiversity Strategy was launched. In December 2008, a workshop on formulating the National Biodiversity Strategy was held, and the 2nd National Biodiversity Strategy was established in May, 2009 through a joint effort among 11 relevant government ministries.

The 2nd NBSAP for 2009-2013, focused on the equitable sharing of benefits from biodiversity and the sustainable uses of biological and genetic resources, has been pursued jointly by 11 relevant government bodies in 5 core areas and 14 strategies originally. In 2011, the original 2nd NBSAP was revised in order to reinforce the areas related the equitable sharing of benefits arising from the use of genetic resources to reflect the Nagoya Protocol.

The Government of Korea had reviewed the achievement of NBSAP 2009-

2013 in the 21st Committee on Green Growth and the 11th Meeting for Reviewing Implementation in 2012. In the review, 18 tasks out of 24 were judged as ‘satisfactory’ and the following 6 tasks needed more improvement:

- Expansion and conservation of protected areas
- Conservation of genetic diversity
- Establishing the system of countermeasure for climate change
- Securing and utilizing biological resources
- Expanding education programs and raising professional manpower on biodiversity
- Establishment of the information sharing system.

## Outcomes

The 1st NBSAP claimed on the conservation of biodiversity, the sustainable use of biological use, capacity building and better management practices. The 2nd NBSAP was developed with the emphasis on the equitable share use of biological resources, effective response mechanisms for future challenges and international cooperation.

Major achievements made with two previous national biodiversity strategies were:

- ✓ The expansion of infrastructure for biodiversity conservation
- ✓ The enhanced understandings and management system for biological resources
- ✓ The increase of the coverage of protected areas
- ✓ The development of international cooperation.

## Expansion of Infrastructure for Biodiversity Conservation

Comprehensive understanding on the biological resources in Korea was accelerated with the establishment of the new national institutions for the research and management of biological resources. The National Institute of Biological Resources, which was newly established during the time of the 2nd NBSAP, has led ‘Native Species Survey Project’ since 2007. Since the project was launched in 2007, the number of species in Korea was increased from 28,462 in 1996 to 41,483 as of the year 2013.

National research organizations specializing in biodiversity and its

conservation have been continuously stabled to enhance the research capacity and conservation of biological resources in Korea. The most recent agency was National Institute of Ecology (January 2014), and more are scheduled to open: Marine Biodiversity Institute of Korea (2014), National Institute of Nakdong River Biological Resources (2014), National Baekdudaegan Arboretum (2015), National Endangered Species Restoration Center (2016), and National Sejong Arboretum (2017).

### Understandings and Management System for Biological Resources

In parallel to the active survey on biological diversity in Korea, database of species and genetic resources have been built to enhance understandings on national biological resources. From the record in August of 2012, Korea have obtained diverse genetic resources such as 51,445 items of wildlife genetic resources, 307,973 items of agricultural genetic resources and 246,182 items of marine genetic resources.

One of major challenges Korea experienced is the reduction in biodiversity due to the expansion of population and the habitat loss caused by the rapid industrialization. Restoration programs were established to reintroduce the extinct species in Korean Peninsula and to increase the population of nearly extinct species. The Ministry of Environment revised the Endangered Wildlife Proliferation and Restoration Plan in 2011, which was originally developed in 2006. The National Center for Restoration and Endangered Species is under construction for 2013-2016. The restoration and proliferation programs for Asiatic black bear and fox were strengthened. Recently, the government has also expanded the restoration program of Crested Ibis, which became extinct in Korea in late 1970, with inter-nation collaboration between Korea and China.

The ecological risk assessment was set up to control invasive alien species (IAS). This was to protect endemic biological diversity and resources as well as to minimize the biological impact and the ecological disturbance by preventing the settlement and spread of IAS around the country. Policy directions for controlling IAS are:

- To promote early detection, surveillance and rapid response of the alien species coming into the country
- To assess ecological risks for biodiversity
- To manage, mitigate and restore of ecological risk caused by alien species,



- To build governance amongst central, local governments and local resident as well as international societies,
- To raise public awareness and education to control alien species.

### Increase of the Coverage of Protected Areas

Restoration and protection efforts for natural habitats at national level were also proactively sought after with the significance of the government's role to be continuously acknowledged. Amendments in related regulations were introduced in order to systematically categorize the designation of protected areas. National Parks as well as the areas with excellent scenery, sites with rare biodiversity resources, wetlands and various islands were included, which resulted in the increased number of nationally designated protected areas from 1,297 in 2008 to 1,402 in 2013. In 2013, Mt. Mudeungsan was newly designated as a national park.

Private lands were also purchased and turned into protected areas for expanding the ecological continuity. In Baekdudaegan Mountain Range, the mountainous ridges running north to south in Korean Peninsula, which is one of three main ecological belts of Korea, the area of 12,690 ha private lands was purchased.

### Development of International Cooperation

Biodiversity issues must be considered at both global and national levels through the implementation of international agreements to further enhance effective international partnerships. Korea has been pursuing active roles in global environment issues by maintaining close relationships with other countries and relevant organizations for multilateral agreements such as CBD, UNFCCC, UNCCD and the Ramsar Convention.

Korea has been building strong international partnerships as hosting COP10 of the Ramsar convention and UNCCD COP10 in 2008 and 2011, respectively, and CBD COP12 in 2014. Especially taking CBD COP12 as an opportunity, the government of Korea attempts to strengthen its stance the environmental issues in global society. Korea is also seeking out to share the experience and knowhow of economic growth in a sustainable way with developing countries in response to the request of expanding ODA with the recent participation in OECD DAC in 2010.

## DEVELOPMENT OF THE 3RD KOREA'S NBSAP FOR 2014 - 2018

Korean government enacted ‘the Act on the Conservation and the Use of Biodiversity’ in February of 2012 in order to actively respond to the globally changing demands such as the Nagoya Protocol adopted at CBD COP10. Three major purposes of the Act are:

- Enhancing biodiversity by creating a national management system
- Promoting the sustainable use of biological resources
- Expanding the cooperation with the international mechanisms including the Convention and the Nagoya Protocol

Articles 7 and 8 of this act stipulate that national biodiversity strategy should be established in every 5 years, and that heads of related agencies of the central government should set up and practice related action plans for the full implementation of national biodiversity strategy.

According to these legal requirements, the 3rd Korea's National Biodiversity Strategy for next 5 years of 2014-2018 was established in March of 2014. Following the adoption of the 3rd NBSAP, the detailed implementation plans for 2014 were provided from the related agencies of the central government. These yearly implementation plans are to be reviewed and renewed every year for the established national biodiversity strategy.

The most core objectives of the new NBSAP are mainstreaming biodiversity and sustainable use of biological resources as the hosting country of CBD COP12. Based on the guidelines suggested in National Biodiversity Committee, the Ministry of Environment completed detailed action plans with the consultation of related ministries and agencies of the central government in 6 priority strategies and 18 main targets including indicators. The action plans have been formulated to make concrete strategies including most of all aspects to achieve 2020 global Aichi targets.

## Act on the Conservation and the Use of Biodiversity

**Article 7.** The Government should establish the National Strategies for the Conservation of Biodiversity and the Sustainable Use of its Constituents (referred to as 'National Biodiversity Strategies') in every 5 years.

.....

**Article 8.** The heads of related administrations of the central government should set up and implement action plans for the established National Biodiversity Strategies.

.....

### The Trend of Biodiversity Policy in Korea

As the Act on the Conservation and the Use of Biodiversity was enacted in 2012, Korea's National Biodiversity Strategy became strongly reinforced with the legal status, which is of greater importance than the previous 1st and 2nd National Biodiversity Strategy of non-legal decisions. Even the government had enacted several regulations indirectly relating to biodiversity conservation in the past, this act became a significant turning point for Korea in that national level approaches were proactively pursued, promoting the systematic policies for the conservation of biodiversity. The government also seeks to raise the public awareness on this crucial topic. Furthermore, the Korean government makes efforts in implementing a wider range of acts related to the conservation and management of national environment and ecosystem.

Year 1997 .....→ Year 2009 .....→ Year 2014

1st National Biodiversity Strategy	2nd National Biodiversity Strategy	3rd National Biodiversity Strategy
"Preparing conservation and management system"  • 1991: Enactment of the National Environment Conservation Act • 1993: CBD, 1994: Republic	"Conservation and Sustainable Use"  • 2002: COP6 Biodiversity Targets 2010 • 2005: Comprehensive plan for biological resource	"Expanding the future value of biodiversity"  • Mainstreaming of biodiversity • Conservation and restoration of biodiversity • Sustainable use of

<p>of Korea joined the CBD</p> <ul style="list-style-type: none"> <li>• 1997: 1st National Biodiversity Strategy</li> <li>• 2000: UN Millennium Development Goals</li> <li>• 2004: Enactment of the Act on the protection of Wild Animals and Plants</li> </ul>	<p>conservation</p> <ul style="list-style-type: none"> <li>• 2007: Establishment of the National Institute of Biological Resources</li> <li>• 2009: 2nd National Biodiversity Strategy</li> <li>• 2010: COP10 Strategy Plan 2011-2020 and adoption of the Nagoya Protocol</li> <li>• 2012 : Enactment of the Act on the Conservation and the Use of Biodiversity</li> </ul>	<p>biological resources</p> <ul style="list-style-type: none"> <li>• Reinforce international position on biodiversity</li> <li>✧ Taking CBD COP12 as an opportunity, the government of Korea confirms to strengthen its stance in global environment society</li> </ul>
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## Vision, Strategies, and Goals

The value of biodiversity has become newly illuminated as the ultimate resource and solution for the necessities of human livings such as foods, energies, shelters, medicines, clothes, etc. The 3rd National Biodiversity Strategy adopts the principles of the conservation and the sustainable use of biodiversity to achieve the vision of ‘creative economy’. The 3rd National Biodiversity Strategy proposes 6 priorities for action and 18 goals for 2014-2018, of which action plans are suggested for the full implementation.





## Indicators

Priorities For Action	Indicator	2014		2018	
		Goal and Target			
I. Mainstreaming biodiversity	Expand practicing of biodiversity strategy by local government		1 places		8 places
	Strengthen biodiversity conservation at the stage of establishing policies		Adopting the linkage system between land and environment plan		
	Raise public awareness of biodiversity		73%		90%
	Increase beneficial subsidies on biodiversity		Construct secure funding		
	Expand the management system on wildlife in zoo/botanical gardens		Revising laws related to zoo/botanical garden		
	Strengthen public's compensatory damages caused by wild animal		Subsidiary compensation for the damage by wild animals		
	Expand wild animal rescue center		12		16
	Prepare the foundation of research on wild animal diseases		Promoting 'National wild animal health research institute'		
	Implement surveys on the distribution of endangered species		Triennially		Annually
	Publish Red List of Korea		7 publications		12 publications
II. Strengthening biodiversity conservation	Expand propagation and conservation of endangered species in Korea		Founding national restoration center of endangered species		
	Control import and export of globally endangered species (CITES)		Publishing manuals for species identification		
	Examine the ratio of endemic species' in Korea		5.2%		7%
	Expand 'endemic plants conservation institute'		3 places		10 places
	Modify the management system on natural heritage		Enacting Natural heritage act		
	Expand the coverage of protected areas and conservation programs		17% for lands and inland waters (by 2020)		
	Construct phylogenetic tree's for species of particular importance in Korea		3,000 species		6,600 species
	Collect and register agricultural plant genetic resources.		2,000		10,000

Priorities For Action	Indicator		
	Goal and Target	2014	2018
III. Reducing treats to biodiversity	Expand the designation of alien species disturbing ecosystem	24 species	100 species
	Prepare supplementary protocol on liability and redress	Implementation of supplementary protocol	
	Develop DNA analysis technique to distinguish imported LMOs.	33 cases	60 cases
	Expand designation and eradication of pest of prior concern	40 species	100 species
	Predict change in species vulnerable to climate change	40 species	90 species
	Develop new cultivars adaptable to climate change (major crops)	-	27
	Establish national arboretums for various climates and vegetation zones	5sites	
	Develop national environmental map	demo project	completion of development
	Promote restoration of fragmented areas in core ecological belts in Beakdudeagan	construction of 50 ecological pathways	
	Promote restoration of damaged areas of 'Demilitarized Zone (DMZ)'	Restore 100 ha/year	
IV. Sustainable use of ecosystem service	Increase biodiversity in organic agriculture lands	365	2,000
	Acquire useful forest plant resources	50%	60%
	Expand investigation and research of traditional knowledge on native species	250 cases	600 cases
	Build DB of traditional knowledge	-	Construction of DB
	Expand the designation of eco-tourism areas	7 places	30 places
	Restoring forests in traditional towns	59 places	117 places
	Expand eco-sharing project for vulnerable class of society	38,000	160,000

Priorities For Action	Indicator		
	Goal and Target	2014	2018
<b>V. Research and management mechanism of biodiversity</b>	Construct list of species of Korea	41,483	50,000
	Collect biological specimens	2.80mi	3.54mi
	Revise ecological zoning maps	398	794
	Expand KBIF (Korean Biodiversity Information Facility) network	46 organizations	50 organizations
	Increase biodiversity research institutes	3	6 in operation
	Complete implementation and ratification system of the Nagoya protocol	Legislation and its implementation	
	Expand registration of genetic resource for national management	65,000	85,000
	Expand designation of biological resources for the permission export	1,971 species	4,300 species
	Promote monitoring current status and changes in ecosystems of DMZ areas	Promoting annual research	
	Hosting COP 12	Pyeongchang roadmap to implement global target	
<b>VI. International collaboration on biological diversity</b>	Expand funds to developing countries	Increasing the amount in two times of the annual average of 2006-2010	

# PRIORITY FOR ACTION 1

## I . Mainstreaming biodiversity

- II . Strengthening biodiversity conservation
- III . Reducing threats to biodiversity
- IV . Sustainable use of ecosystem
- V . Research and management mechanism of biodiversity
- VI . International collaboration on biological diversity

### 1. Strengthening the foundation to execute biodiversity policies



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*Indicator: Expand practicing of biodiversity strategy by local governments Strengthen biodiversity conservation at the stage of establishing policies*

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#### Current Status

Given the significance the biodiversity holds in preserving the environment, society and general health of our economy, it is necessary to pursue mainstreaming biodiversity when policy making and planning. Korean government had prepared implementing systems by setting up National Biodiversity Strategy twice in past, but it has been somewhat insufficient to service as a detailed guideline for the local governments. The 3rd NBSAP, as the most significant legal plan so far, is expected to help integrate and harmonize existing biodiversity plans. The action plan of the 3rd NBSAP will be implemented in reflection with related policies with an aim to be effective at local as well as at central level.

According to Local Action for Biodiversity by International Council for Local Environmental Initiatives (ICLEI), Gyeongsangnam-do Province and Gangwon-do Province have adopted biodiversity strategy in 2013



and 2014, respectively.

### Outcomes from previous NBSAPs

- ✓ Establishing and implementing the yearly action plan on bio-research resource management on the basis of the master plan established by pan-government collaboration in 2011.
- ✓ Applying the measures of forest biodiversity conservation and improvement to legal plans.
- ✓ Implementation and review on the 1st action plan for the conservation and management of marine ecosystems
- ✓ Establishing the provisional plan for the conservation of marine species for protection
- ✓ Applying the measures of forest biodiversity conservation and improvement to legal plans
- ✓ Study on linking system and foundation by national environment policy forum (Mar-Jun 2013)
- ✓ Agreement on the measure in the linking system by operating a task force for collaboration between ME and MOLIT (Dec 2013)

### Action plans 2014-2018

1. Harmonized biodiversity strategies in place for both central and local governments
  - Promoting the 3rd NBSAP for 2014-2018
    - The ME provides ‘Guidelines for Planning Local Biodiversity Strategy’ to local governments (2014, ME), and promotes the local governments to set up and to implement local biodiversity strategies (one province in 2013 → 8 metropolitan cities/province in 2018)
    - Establishing a legal basis for metropolitan cities/provinces to set up biodiversity strategies in Act on the Conservation and the Use of Biodiversity.
    - Local governments should reflect practical biodiversity targets in setting up related official plans such as Practical Plan of Conservation of Natural Environment, Detailed Plan to Protect Wild Life, etc.
2. Pan-government cooperation
  - MSIP: Establishing ‘the 2nd Master Plan for Management of the Bio-

resource for Research to promote utilizing bio-resource for research and to manage related information (2016)

- MAFRA: Practicing ‘Agro-biological Resources Master Plan (2014-2018)’ and drawing up the yearly practical plan for ‘Seed Industry Promotion Master Plan’
- ME: Establishing ‘the 2nd Natural Environment Conservation Master Plan (2016-2025)’, ‘the 3rd Wild Life Protection Master Plan (2016-2020)’ and implementing official plans such as ‘the 2nd Natural Park Master Plan (2013-2022)
- MOF: Evaluating and establishing the revised 2nd plan for ‘Conservation and Management Basic Plan for Marine Ecosystem (2009-2018)’ by 2018.
- CHA: Practicing and evaluating ‘Cultural Heritage Preservation, Management and Use Five-Year Master Plan (2012-2016)’ on natural monuments and national scenic places, and establishing the plan for next phase
- KFS: Practicing ‘the 2nd Forest Biodiversity Basic Plan (2013-2017)’ and ‘Arboretum Promotion Master Plan (2014-2018)’ for *ex situ* conservation of forest botanical resource. Establishing ‘Master Plan for the Management of Protected Area’ (from 2014)’

### 3. Linkage system between land management and environment plans

- Preventing biodiversity loss by introducing the linkage system between land use and environment plans at the stage of establishing policies
- Series of legal amendments to be applied to the linkage system; ‘Framework Act on Environment Policy’ and ‘Framework Act on the National Land’ (submitted to National Assembly in 2014 and effected in 2016)
- Modifying various laws and regulations on conservation, restoration and management of water ecosystem; revision of the present ‘Act on Water Quality and Water Ecosystem,’ which is operated through the management of pollutant element, with emphasis on the conservation of biodiversity

## Targets and actions 2014

- Prepare the foundation for promoting local biodiversity strategy
- Establish (April 2014) and practice '2014 Implementation Plan for the Management of Bio-research Resource'
- Establish Agro-biological Resource Master Plan 2014-2018
- Establish the 2nd master plan for the conservation of marine ecosystem
- Revise 'Framework Act on the Environment Policy' with expert discussion and pre-announcement of legislation

*Cypripedium macranthos* by Young Hee Lim



Priority 1

Priority 2

Priority 3

Priority 4

Priority 5

Priority 6

## 2. Raising public awareness and participation



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*Indicator: Raise public awareness of biodiversity*

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### Current status

It is important to raise public awareness for promoting active voluntary participation of the general public. Although relatively the level of public awareness on biodiversity is relatively high in Korean society, poaching, illegal collection and traffic of wildlife are still occurring in this day and age. The CBD COP12, which will be held in Korea in 2014, will be a good opportunity to raise the public awareness and to promote the participation of stakeholders in biodiversity programs

- The level of the public awareness of biodiversity in Korea is reported to reach 70%: Brazil 96%, France 96%, China 94%, Japan 62%, and US 54% (Biodiversity Barometer, 2013)

### Outcomes from previous NBSAPs

- ✓ Running the programs experiencing and exploring biodiversity
- ✓ Developing and operating biological resource educational programs.
- ✓ Promoting and raising public awareness on biodiversity by conducting surveys on public awareness
- ✓ Carrying out 'Forest Care Movement'
- ✓ Holding BioBlitz Korea 2013 in Mt. Cheongtaesan
- ✓ Promoting public education and awareness with the use of infrastructure such as natural recreational forests, arboretums and ecological forests
- ✓ Expanding forest education to promote the holistic growth of children and youth and the awareness of biodiversity
- ✓ Promoting the participation of stakeholders: CBD Expert Forum, Korea Business and Biodiversity Initiative, National Biodiversity Committee and National Biodiversity Center

### Action plans 2014-2018

1. Raising public awareness on biodiversity and education



- Conducting surveys on public awareness of biodiversity (2014)
  - ‘Biodiversity Index Initiative (BIP)’ of the Convention, feedback the result of public awareness survey of biodiversity into biodiversity policy
- The public participating programs to raise awareness of biodiversity such as BioBlitz, Forest Care Movement, etc.
  - Running various public participating programs such as Biodiversity Day, Fascination of Plant Day, World Wetland Day, Ocean Day, BioBlitz, etc.
  - Establishing ‘Master Plan to Promote Awareness of Marine Ecosystem’ and yearly action plan considering mid- and long-term roadmap
  - Raising public awareness on forest protection; ‘Forest Care Movement’ with the collaboration of government and the public, and expanding the program of ‘Forest Care Leader’ (currently, more than 24,000 students are participating in this program).
- Expanding education and publicity to promote biodiversity awareness
  - Operating Biodiversity Education Network through the biodiversity management institutions and developing the qualification and training programs for biodiversity education specialists
  - Publication of education materials including documentaries on biodiversity Expanding the exhibition tour ‘Visiting Biological Resource Exhibition Center’; from 13 times a year to 18 times a year
  - Collaboration among related organizations of biological resource (National Biological Resource Center, Exhibition Tour of ‘Our land, our living organisms’, etc.)
  - Expanding the operation of ‘Biological Resource Youth Leaders’ and ‘Green Reporter Corps’ for educating the youth, and promoting customer-built education and exhibition function of National Biological Resource Center and National Institute of Ecology

2. Stakeholders participation programs

- Establishing and operating network among stakeholders such as local governments, NGOs and Business sector.
  - Expanding civilian roles in CBD COP12, forming ‘National Biodiversity Civilian Acting Consultative Group’ in 2014
  - Inviting more private companies in the ‘ME - Business Sector Partnership’ program formed in 2013 and providing detailed action guidelines
  - Detailed guidelines for private sector participation to be released in the

first half year of 2014

- Establishing guidelines for the participation of civil groups with the aim to encourage civilian actions by 2015
- Empowering local stakeholders
- Establishing ‘Metropolitan City/Province Biodiversity Action Network’ and expanding the support for the action of private sector in collaboration with National Biodiversity Committee and National Biodiversity Center.
  - \*According to Article 17 of the Act on the Conservation and Use of Biodiversity, National Biodiversity Center was established in National Biological Resource Center in March, 2013.
  - Establishing network of research institutions of metropolitan cities, provinces and experts in 2014 for information sharing and distribution to develop local action guidelines
  - Promote engagement programs that can encourage wide range of the general public to experience and explore the nature.

#### Target and action 2014

- Continue to raise public awareness on the importance of biodiversity conservation by broadcasting and social network service
- Hold biodiversity exhibitions to encourage public participation
- Continue to raise public awareness on the importance of biodiversity conservation by broadcasting and social network service
- Hold the BioBlitz Korea 2014
- Enhance the participation of stakeholders by supporting the activities of private sector related to National Biodiversity Committee and National Biodiversity Center
- Share and disseminate information through the network of metropolitan cities and provinces

### 3. Expanding the budget



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*Indicator: Raise public awareness of biodiversity*

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#### Current Status

It is necessary to establish adequate financial measures by accurately understanding the current status of biodiversity. Existing state-funded subsidies on agriculture, fishery, transport or energy, etc. could provide short-term economic benefit, but may well be harmful to the health of biodiversity due to environmental damage and resource depletion. OECD countries are still providing environment harmful subsidies of over 400 billion US dollars per year to traditional industries such as agriculture and energy. However, actions to bring reforms on this damaging practice are now in place, imposing ecosystem conservation cooperation charges (KEI 2006).

Thorough examination on the state funded subsidies and their impact on environment must be carried out. Also needed is step by step approach to increase government subsidies that are beneficial to biodiversity.

Exemplary case of beneficial subsidies: ‘Biodiversity Management Contract’ was developed by local governments and residents. Under this contract, farmers left some crops for migratory birds and then local governments compensated them for the loss (6.66 billion and 3 billion KRW in 2011 and 2012, respectively).

#### Outcomes from previous NBSAPS

- ✓ Adjusting the compensatory charge for ecosystem conservation
- ✓ Expanding the programs to support the contract for biodiversity management

#### Action plans 2014-2018

1. Understanding the status of state subsidies related to biodiversity
  - Since contracting parties of CBD were requested to submit reports on biodiversity fiscal expenditure, problems, priority, etc. by 2015, related reports will be completed by 2015. Furthermore, the state funds and

budget will be regularly monitored.

- Listing categories: 1) ODA, 2) State budget, 3) Private sector, 4) NGO, foundation, academic societies, 5) International financial organization, 6) UN organization, fund, program, 7) Public fund except for ODA, 8) South-South Cooperation Initiative, 9) Technical collaboration
- Examining the effect of state subsidies on biodiversity (2014-)
  - Studying harmfulness extant, biased influence, improvement effect, etc. of subsidies on each major industrial field such as agriculture, fishery, etc.
  - Preparing a roadmap to improve state subsidies (2015)
  - Subsidies harmful to biodiversity are to be classified and suspended immediate suspension and conversion, and then gradual solutions and mid-term roadmap will be designed.

## 2. Gradual expansion on subsidies beneficial to biodiversity

- Continuing efforts to expand subsidies beneficial to biodiversity
  - Expanding Water System Management Fund for strengthening health of water ecosystem (21.7 billion KRW in 2013 → 30 billion KRW in 2018)
- Improving the system to impose ecosystem conservation cooperation charge
  - In consideration of ecosystem service value, similar charging system will be expanded. More projects will be targeted and the financial charge will also be increased (2014).
  - The amount of charge for marine ecosystem conservation will be rescheduled.
  - Since the initial decision on ecosystem conservation cooperation charge (Natural Environment Conservation Act, Article 46-1) to be 250 KRW/m<sup>2</sup> in 2001, it has remained unchanged. Considering loss of biodiversity and ecosystem service value due to development, reasonable adjustment is necessary. The amount of charge should be readjusted every year through official notification. Forest Resource Replacement Charge, which has a similar concept to Ecosystem Conservation Cooperation Charge, the charge is 3,070 KRW/m<sup>2</sup> for semi-conservation mountain area, 3,990 KRW/m<sup>2</sup> for conservation mountain area and 6,140 KRW/m<sup>2</sup> for alteration restriction zone. These figures are about 10 to 25 times of that of Ecosystem Conservation Cooperation Charge as of 2013.

## 3. Foundations of financial measures for biodiversity conservation

- Establishing secure foundation for promoting biodiversity policies by

launching so-called ‘National Biodiversity Conservation Fund’ in 2017 with comprehensive efforts of the government, public and private business sectors.

- Using the fund for implementing National Biodiversity Strategy, protection of wildlife and habitat and raising the public awareness
- Studying how to raise conservation fund, how to find corresponding projects, and how to establish operating system with utilizing social contribution of private companies, eco-tourism, individual donation and state fund

#### Target and action 2014

- Increase the compensatory charge for ecosystem conservation  
Completion of the review by the Office of Legislation
- Provide government subsidies to local governments for expanding the programs to support the contract for biodiversity management

Priority 1

Priority 2

Priority 3

Priority 4

Priority 5

Priority 6



Flock of migratory birds in winter at Suncheon Bay, Jeollanam-do Province,  
by Hyung Seok Lee

# PRIORITY FOR ACTION 2

I. Mainstreaming Biodiversity

## II. Strengthening biodiversity conservation

III. Reducing threatening elements of biodiversity

IV. Sustainable use of ecosystem

V. Research and management mechanism of biodiversity

VI. International collaboration on biological diversity

### 4. Protection and management of wildlife

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*Indicator: Expand the management system on wildlife in zoo/botanical gardens*

*Strengthen public's compensatory damages caused by wild animals*

*Expand wild animal rescue center*

*Build master plan of research on wild animal diseases*

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#### Current Status

Maintaining ecosystem service and sustainable use of ecological resources can be achieved by preventing biological organisms from extinction and enhancing biodiversity through systematic protection of wildlife and its habitat. In spite of diverse programs of wildlife protection and management in Korea, poaching and drastic increase of specific species cause the imbalance of ecosystem. It is necessary to develop wildlife management programs on the topic of wildlife animal disease and treatment.

- Threats against wildlife are continued by increased number of road kills due to habitat fragmentation, poaching and illegal trading
- With the extinction of predators, the population of wild pigs is in rapid increase. They often appear in downtown. Water deer (*Hydropotes inermis*) and roe deer (*Capreolus pygargus*) populations also growing



rapidly in Jeju Island. This rapid increase of certain species causes disorder in ecosystem balance.

### Outcomes from previous NBSAPs

- ✓ Improving the management of collecting and capturing wildlife
- ✓ Minimizing the incidental catches of marine species
- ✓ Expanding the establishment of wild animal rescue and management centers
- ✓ Improving working conditions and manpower in wild animal rescue and management centers
- ✓ Increase the designation of marine animal rescue and treatment center

### Action plans 2014-2018

#### 1. Management and protection programs of wildlife habitat

- Establishing advanced management system for wildlife breeding
  - Installing and expanding the ecological corridor areas for wild animals' welfare by revising related regulations in 2014
- Habitat protection and its management
  - Restoring habitat by expansion of biodiversity management contract area for the protection of migratory birds
  - 'Living together with wildlife project' (2013-) and developing co-existence strategy with wild animals by preparing the manual of behavior in encountering wild animals and prevention program for wild animal appearance
- Prevention mechanisms for damage compensation caused by wild animals
  - Surveying the state of wild pig population in urban areas and continuing the support for installation of damage prevention facility.
  - Increase compensation for the crop damage, introducing the system of 'Wild Animal Damage Compensation Insurance'
  - Some local governments (for example, Taebaek, Kimcheon, Whasoon, etc.) developed a contract for damage compensation. With this in place, insurance companies are to support famers for the crop loss caused by wild animals.

#### 2. Ban on poaching and illegal trade of wild animals

- Systematic management of wild animals through examination and

evaluation of wild animals every year.

- Through monitoring networks in collaboration with regional environmental office, NGO, prosecutors' office and police department, punishment of poachers and illegal traders will be strengthened along with a national crackdown on this damaging practice. 82% of Koreans replied that the punishment level should be raised in poaching and illegal trading (Wildlife Management Association-Korea Research Survey, 2010)
- Evaluating yearly damage from wild animals.
  - Designating and controlling harmful wild animals (in urban areas) by examination and evaluation damage caused by wild animals every year
  - Establishing mid and long-term enhancement plan such as designing on-line system for identification tag of hunted animals (2014)
- Minimizing incident captures of marine animals and establishing preventive measures.
  - Assessing the current status of incident capture of marine animals, supporting the equipment to prevent incident capture, rewarding for the release of incident captures, prohibiting the sales of incident captures.
  - Raising the level of penalty for incident capture of whales and illegal trading

### 3. Wild animal rescue and disease control

- Enhancing wild animal rescue and treatment plans and national animal monuments
  - Operation of wild animal rescue centers, with more centers in major cities to be opened in Seoul, Incheon, Daegu and Gwangju (from 12 centers to 16 centers nationally by 2018)
  - Supporting and increasing the treatment centers of national animal monuments from 238 branches to 250 branches
  - Supporting the rescue and treatment of marine animals (9 institutes)
- Research on wild animal diseases
  - 'National Wild Animal Health Research Institute' to be founded in 2018.
  - Epidemiological surveys and disease diagnosis by the revision of 'Act on Wild Animal Protection and Management' in 2014
  - Preparing mid and long-term plan of 'Wild Animal Infectious Disease Research' and pre-feasibility study in 2015

- To effectively identifying the cause, responding to outbreaks and preventing the spread of Avian Influenza.
- \* Five major development: Pre-recognition and monitoring technology, diagnosis and prevention technology, prevention of outbreaks and post-management technology and development of drugs for animals

#### Target and action 2014

- Designate releasing places for incidentally captured porpoises and practice monitoring of stow-net fishery
- Establish the National Migratory Bird Research Center and regional centers to identify birds' migration route.
- Develop 'Research/Development Promotion Plan Responding AI' (Feb. 2014, MAFRA, ME and MOHW) to be in place

Priority 1

Priority 2

Priority 3

Priority 4

Priority 5

Priority 6

*Pteromys volansaluco* in Gyeongju, Gyeongsangnam-do Province, by Hae Bok Shin



## 5. Protecting species of major importance



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*Indicator: Implement surveys on the distribution of endangered species*

*Publish Red List of Korea*

*Expand proliferation and conservation of endangered species in Korea*

*Control import and export of globally endangered species (CITES)*

*Examine the ratio of 'endemic species' - in Korea*

*Expand 'endemic plants conservation facilities'*

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### Current status

As the vulnerability of endangered species in Korea becoming an alarming issue, institutionalized protection and management are necessary. With the potential value of biodiversity in mind, an intensive level of care should be given to endemic species of Korea. According to the Red List of Korea, 27 mammals, 58 birds, 5 reptiles and amphibians, 27 fishes and 224 vascular plants are extinct or critically endangered, and the number of species needed to be protected is 2,177, which is 5.6% of total species in Korea.

- Since the number of critically endangered species are increasing due to catch, overhunting, poaching and loss of habitats, mid and long-term conservation plan for endangered species and marine organisms are strongly requested to be established at national level.
- \* Protection systems for endangered and legally protected species by relevant government agencies: Endangered species (249 species by ME), rare plants (571 species by KFS), wildlife protected by local governments (305 species by municipal governments; Seoul 49, Daegu 47, Incheon 24, Gwangju 56, Daejeon 41, Ulsan 49, Gyeonggi 29, Chungbuk 10) The protection and management plan should be established on the basis of the surveys of endangered species periodically and endemic species annually, overcoming the extinction crisis and conserving biodiversity by *in situ* and *ex situ* conservation measures for critically endangered and endemic species

### Outcomes from previous NBSAPs

- ✓ Continuing the proliferation and restoration programs for endangered species
- ✓ Conducting the national distribution survey of endangered species and publishing Red List of Korea
- ✓ Continuing monitoring and regular revision of the marine species for protection
- ✓ Expanding the designation of forest species for special protection and rare endemic plant species, and strengthening their management
- ✓ Promoting the conservation and restoration program of *Abies koreana* endemic to Korea
- ✓ Providing information on CITES species
- ✓ Improving the breeding facilities of CITES species
- ✓ Evaluating the characteristics of endemic species of Korea and publishing their comprehensive manual
- ✓ Operating the propagation farm of national wild plant seed bank
- ✓ Identifying the distribution of endemic marine species and protecting their habitats
- ✓ Collecting genetic resources of rare endemic plants and building centers for *ex situ* conservation
- ✓ Restoring the original ecosystem in Dokdo Island

### Action Plans 2014-2018

1. Endangered species in Korea: monitor and restoration
  - Scientific investigation and management by publishing Red List of Korea, etc.
    - Designation and revision of the legal list of endangered species in every 5 years
    - National distribution survey for endangered species (every 3 years in 2018 → yearly monitoring for each species)
    - Operating systematic, ecological and genetic research programs for endangered species (2014-)
    - Publication of Red List of Korea (7 volumes → 12 volumes)
  - Designation of statutory protected species and protection of habitats
    - Consistent monitoring; by periodically designating and revising statutory protected species, protected marine organisms, rare plants, specially

protected forest species will be monitored and systematically preserved.

- Designating at least one special protected area for wildlife per each endangered species, and expanding the designation of special protected area in national parks for endangered species
  - Mid and long term conservation plan for statutory protected species and related programs
    - Promoting mid and long-term conservation plan for endangered species (2012–2016) and conservation plan for marine protected species (2014–2018)
    - Revising the 2nd breeding and restoration comprehensive plan for endangered species (2013–2017), and establishing the breeding and restoration plan for marine protected species
  - Strengthening *ex situ* conservation of endangered species
    - Promoting overall management to restore endangered species and executing restoration projects for extinct large animals in Korea.
    - \* Acquisition of additional 14 individuals of species under breeding programs; Asiatic black bear, mountain goat, fox and crested ibis (2014)
    - Expanding institutions for *ex site* conservation and breeding of endangered species from 23 to 28, and conservation centers of rare plants from 3 to 10
2. Dissemination of globally endangered species and CITES implementation
- Improving management and information system of endangered species listed in CITES
    - For efficient management of export/import of CITES species, information and DB sharing with relevant agencies, classification and identification manuals for frequently traded species required to be developed (2015–).
  - Facilitating public access to search for CITES species by linking Wildlife Export Import Civil Service System of ME and Korea Customs Clearance System (2015–)
  - Tightening related regulations to promote healthy breeding facilities of CITES species
    - Defining registration of species in breeding facilities, installation standards for breeding facility, animal management standards, etc. in sub-regulations of ‘Act on Wildlife Protection and Management’

3. Investigation and research on biological resources



- Revising and improving ‘Korean Peninsula Endemic Species Search Mid and long-term Roadmap (2011)’, and raising the ratio of endemic species by systematizing the search for endemic species

- Searching for endemic species in parallel to ‘Native Species Search Project’, and raising the ratio of endemic species from 5.2% (2,177 species) to 7% in 2018

- Preparing identification and classification standards for endemic species and publishing revision of comprehensive manual of endemic species

- Strengthening protection measures of endemic species by *ex situ* conservation

- Expanding ‘Endemic Plants Conservation Institute’ for conservation of endemic plants from 3 to 10

- Improving management system of national natural monuments and scenic areas by establishing ‘Act on Natural Heritage’

#### 4. Planning restoration and management measures of endemic species of Ulleungdo Islands and Dokdo Islands

- Examining the current distribution and status of endemic species in the areas of Ulleungdo Islands and Dokdo Islands

- Identifying remaining individuals for endangered species and surveying the current status of habitats
- Identifying endangered species such as seals and sea lions to secure national level of protection in Korea
- Creating protection and management measures for their habitats in case of confirming their existence

#### Target and action 2014

- Revise the ‘Act on the Protection and Management of Wildlife’ to establish a legal basis upon which to review the list of endangered species regularly (2014)
- Release proliferated red fox and long-tailed goral to the wild and hold a symposium to commemorate ten-year restoration of Asiatic black bear (2014)
- Provide standard protocols for the breeding facilities of CITES species (2014)
- Review the list of endemic invertebrates of Korea and publish the fauna of endemic invertebrates including some insect groups of Korea



*Pitta brachyura* by Seong Won Lee

## 6. Expansion and efficient management of protected areas



*Indicator: Modify the management system on natural heritage*

*Expand the coverage of protected areas and conservation programs*

### Current status

Strategic Plan for Biodiversity 2011-2020 suggests that 17% of world terrestrial and inland water areas and 10% of coastal and marine areas be conserved through designation of protected areas. Korea's current ratios of protected areas of 12.25% for terrestrial and 1.2% of marine areas are far below the suggestion, and it is necessary to improve effectiveness in evaluating in order to monitor the management progress of protected areas.

### Outcomes from previous NBSAPs

- ✓ Expanding the designation of protected areas : 26 islands newly added
- ✓ Expanding marine protected areas : 3 marine areas newly designated
- ✓ Expanding forest genetic resources protected areas : Increase from ca. 22,000 ha in 2004 to 149,000 ha in 2013
- ✓ Expanding Baekdudaegan Mountain Range protected areas: The 1st expansion in 2013 since its establishment in 2005
- ✓ Establishing the master plan for national protected areas
- ✓ Setting up the guideline for management and operation of marine protected areas
- ✓ Promoting effective management of forest genetic resource protected areas
- ✓ Promoting Baekdudaegan Mountain Range as an international protected area
- ✓ Evaluating the management effectiveness of protected areas
- ✓ Designating special protection zones in national parks
- ✓ Designating Mt. Mudeungsan as a new national park

### Action Plans 2014-2018

#### 1. Expanding protected areas

- Designating 17% of terrestrial and inland water areas and 10% of coastal and marine areas as protected areas
- Operating integrated conservation programs: using development restriction zone (greenbelt), protected areas of water source, marine resource protection zone and community based conservation area, which contribute biodiversity conservation

Category of designation		2014	2020
Natural parks (county, province, nation)		132 m <sup>2</sup> /person	153 m <sup>2</sup> /person
Terrestrial ecosystem	Ecosystem and landscape conservation area	234 km <sup>2</sup> (32 sites)	600 km <sup>2</sup>
	Baekdudaegan Mountain Range reserve	2,634 km <sup>2</sup>	3,300 km <sup>2</sup>
	Wetland protected area	155 km <sup>2</sup>	250 km <sup>2</sup>
Marine ecosystem	Marine ecosystem protected area	213 km <sup>2</sup> (9 sites)	600 km <sup>2</sup>
	Coastal wetland protected area	219 km <sup>2</sup> (12 sites)	500 km <sup>2</sup>
Wildlife protection	Wildlife special protected area	920 km <sup>2</sup> (377 sites)	2,750 km <sup>2</sup>
	Forest genetic resource reserve	1,318 km <sup>2</sup>	1,500 km <sup>2</sup>

## 2. Designation and management of protected areas

- Establishing ‘National Master Plan for Protected Areas’ in 2014 to achieve targets of protected areas
- Strengthening 3 major eco-belts of Korea (Baekdudaegan Mountain Range, DMZ and islands-coast)
  - Restoring over 60% of 175,000 km<sup>2</sup> damaged areas in national parks of Baekdudaegan Eco-belt.
  - Executing ecological survey and enhancing biodiversity of the major wetlands in DMZ area.
  - Designation of marine protected areas at islands and coasts, while extending the number of Ramsar designated wetlands in Korea.
- Improving the management system of marine protected areas
  - Notifying ‘Guidelines for management and operation of marine protected areas’ (official order) and strengthening the function of Marine Protected Areas Center in Korea Marine Environment Management Cooperation (KOEM)

## 3. Promoting effective management of protected areas

- Expanding management effectiveness evaluation of protected area

- from 42% to 70% and from 20% to 70% for marine protected areas
- Publishing report on the management effectiveness evaluation of national parks (2014)
- Enhancing the health of habitat
  - Expanding the designation of special protection zone in national parks from 3.5% to 5%

#### Target and action 2014

- Establish the 2nd master plan of islands for special management 2015-2024
- Establish a plan to build basic information system of national protected areas
- Provide principles for systematic conservation and management of marine protected areas by establishing new basic management plans, promote public awareness and operate advisory committee
- Operate 6 forest ecology management centers, continue forest biodiversity enhancement programs, and promote the protection and management collaboration of private forests
- Promote Baekdudaegan Mountain Range as an international protected area
- Establish the analysis and evaluation plan of the management in the major protected areas
- Expand the designation of special protection zones in national parks
- Establish the master plan to designate new national parks

## 7. Conservation of genetic diversity protected areas



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*Indicator: Construct phylogenetic trees for species of particular importance in Korea*  
*Collect and register agricultural plant genetic resources.*

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### Current status

Genetic resources such as seeds indigenous to the region and strains of breeding of long history have great potential values to play a vital role to the human survival. Collection of genetic resources is weighted toward some specific crops and the collection of native genetic stocks has been poor. It is also urgent to analyze economically valuable characters even for the collected genetic resources. The foundation for the beneficial use of genetic resources should be established by examining and studying genetic resources preferentially, collecting, conserving and managing genetic resources from native organisms and operating genetic resources banks systematically.

- \* The collection of agricultural plant genetic resources is ranked 6th in the world in quantity. However, it is much weighted towards food crops resulting in low diversity in the collection of horticultural/special crops. It is expected to face difficulties in taking a lead in the international discussion on the right of genetic resources because native genetic stocks comprise only 20% of seed collection.
- \* According to ‘Master Plan for Agriculture and Fisheries Genetic Resources (2009–2018), Korea is targeting to strengthen its position as the 5th county in genetic resources through securing 330,000 collections for 6,000 species of agriculture plant resource and completing examination of characteristics for 77% of genetic resources by 2018.

### Outcomes from previous NBSAPs

- ✓ Collection projects of reference specimen DNAs for natural history
- ✓ Constructing phylogenetic trees for major biological groups in Korea
- ✓ Researches on major endemic plants in Korea
- ✓ Evaluating genetic diversity and studies on *in situ* conservation of



- forest genetic resources
- ✓ Developing *ex situ* conservation techniques of microbial resources
- ✓ Collecting seeds of endemic forest plants
- ✓ Developing genetic diversity evaluation and management technique of source plants for seed supply
- ✓ Developing varieties of useful forest resource
- ✓ Establishing *ex situ* conservation station of forest plant genetic resources
- ✓ Collecting genetic resources of native and foreign useful plants
- ✓ Establishing foundation for sharing wild biological resources and operating genetic resource bank
- ✓ Operating national wild plant seed bank
- ✓ Operating natural product bank of wild species
- ✓ Establishing and operating storage facility national park genetic resources

### Action plans 2014-2018

1. Examination, research and conservation of genetic diversity
  - Examining phylogenetic relationships of native species by the analyses genetic information
    - Elucidating phylogenetic relationships among native species by the analyses of genetic information with the foundation of big data from 3,000 species to 6,600
    - Establishing convenient identification system using genetic ID by constructing DNA barcode system for 660 species to 2,500 species
  - Promoting protection measures for special habitats of abundant biodiversity
    - Strengthening examination and research of genetic diversity for important biological resource (2014–) and establishing improvement by inspecting actual condition of conservation policy and examining the areas of high genetic resources (2016)
    - Protecting the habitats of good genetic diversity of wildlife by designating as new protected areas in connection with previously designated areas
2. *Ex situ* conservation and development of management system of genetic resources
  - Expanding collection, storage, and *ex situ* conservation of genetic resources
    - Collecting genetic resources and natural products by intensive

- examination of special habitats for collecting diverse genetic resources
- Promoting native plant seed collection project and expanding the examination of seed characteristics to raise the ratio of collection of native plant seeds from 40% to 60%
- Collecting and listing agricultural plant genetic resource from 2,000 collections to 10,000 and expanding integrated management system for livestock genetic resource from 1,000 to 5,000 resources by live and frozen storage method
- Strengthening management technology such as evaluation, management and preservation of useful genetic resources
  - Developing the discriminating criteria for useful and rare genetic value and revising the related official regulations, promoting developments of management manual for genetic resources of vital importance, and developing the technique of cryogenic frozen storage for wild animals, seeds, vegetative body and archaea bacteria
- 3. Expanding establishment and operation of genetic resource banks
  - Expanding establishment of genetic resource management banks
    - Genetic resource bank of wild animals, Korean Collection for Type Cultures operated by Korea Research Institute of Bioscience and Biotechnology, Agriculture Genetic Resource Bank, Registration Authority for Marine Biological Resource Deposition, and Pathogen Resource Bank
    - Establishing new genetic resource banks for wild plant seeds, natural products, and seed vault for long-term storage
  - Establishing the system for strengthening roles and activating operation of genetic resource banks
    - Resolving problems in overlapping collections and similarities among banks, and establishing ‘Development Plan for Genetic Resource Banks’

#### Target and action 2014

- Continue to constructing phylogenetic trees for major biological groups in Korea
- Construct DNA barcode system of wild biological resources
- Evaluate genetic diversity of populations in conservation and designate *in*

*situ* conservation of forest genetic resources

- Develop *ex situ* conservation techniques of marine microbial resources
- Promote collection of genetic resources with high industrial value
- Increase the collection of life science research resources
- Operate national wild plant seed bank and natural product bank of wild species
- Establish and operate storage facility national park genetic resources
- Expand Registration Authority for Marine Biological Resource Deposition
- Operate seed bank and gene bank, and establish seed vault
- Establish the development system of genetic resource bank



Yonggjangseong Ridge in Mt. Seoraksan, by Gyu Young Park

Priority 1

Priority 2

Priority 3

Priority 4

Priority 5

Priority 6

# PRIORITY FOR ACTION 3

I. Mainstreaming Biodiversity

II. Strengthening biodiversity conservation

## III. Reducing threats to biodiversity

IV. Sustainable use of ecosystem service

V. Research and management mechanism of biodiversity

VI. International collaboration on biological diversity

### 8. Safeguard for IAS and LMOs



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*Indicator: Expand the designation of alien species disturbing ecosystem*

*Prepare supplementary protocol on liability and redress*

*Develop DNA analysis technique to distinguish imported LMOs.*

*Expand designation of and eradication of '-pest of prior concern-'*

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#### Current Status

Climatic change and modification of the landscape have a potential to cause the unexpected spread of alien species, aggravating the original biodiversity and ecosystem. It is necessary to practice adequate management of LMOs as concerns grow on the release of LMOs to nature. The total of 2,167 IAS has been listed in Korea, and it is reported that IAS have caused the environmental and economic damage of 22.6 billion KRW for disturbing ecosystems (NIER, 2013).

- \* Agricultural alien pests introduced in Korea are about 320 species, and it is necessary to assess the precise current status of alien pests with the emphasis on pests of particular economic importance.
- \* The incidental release of LMOs to natural environment is of great concern considering the fact that the total imported LMOs reached 784

metric tons (Korea Research Institute of Bioscience and Biotechnology, 2012). It is necessary to periodically monitor the effects of alien species and LMOs on natural environment, while promoting to secure biosafety.

### Outcomes from previous NBSAPs

- ✓ Detailed investigation of alien species
- ✓ Monitoring the species disturbing the ecosystems
- ✓ Monitoring harmful naturalized plants by the type of forest use
- ✓ Nationwide survey and monitoring of alien disease and insect pest
- ✓ Strengthening alien species management
- ✓ Survey and eradication of species disturbing ecosystem in national parks
- ✓ Risk assessment of alien species and strengthening their management
- ✓ Promoting forecasting and monitoring projects to control key alien forest disease and insect pest
- ✓ Securing safety in research environment of LMOs
- ✓ Implementing the Cartagena Protocol on Biosafety
- ✓ Safe management of industrial LMOs
- ✓ Hazard assessment of LMOs for health and medical purpose
- ✓ Strengthening measures in imports, production, utilization and safety management of LMOs for health and medical purpose
- ✓ Safe management of experimental LMOs for research purpose
- ✓ Safe management of bio-safety research facility and production process facilities
- ✓ Expanding biological safety environment such as public awareness and education on LMOs
- ✓ Tasks on LMO safety management

### Action plans 2014-2018

1. Joint response with neighboring countries for the survey of spread and influence of the alien species
  - Establishing the risk assessment system
    - Isolating and identifying alien pathogens introduced by international travelers
    - Listing alien species by surveying yearly the area of distribution, and operating monitoring program of alien species



- Monitoring organisms disturbing ecosystem and making digital maps of national parks
  - Regularly monitoring organisms disturbing ecosystem (2014–)
  - Sharing information with neighboring countries on distribution and growth of invasive alien species through the research programs; prediction and analysis of distribution and migration pattern (2015–)
  - Establishing digital map system of the distribution and change of alien species in national parks
  - \* Establishing the office of exclusive responsibility and recruiting human resources for the management of alien species in national parks (38 staffs → 200)
- 2. Risk assessment and relief projects of alien species
  - Establishing and executing management plan of alien species
    - By the establishment of ‘Comprehensive Plan for Management of Alien Species (2014–2018), carrying out designation and management, monitoring, and determining and executing the eradication measures
  - Proactive management system for the import of alien species
    - Designating authorized government body to examine the current status and operate risk assessment system.
    - Officially designating the harmful species of concern
  - Expanding risk assessment and designation of alien species
    - Expanding the designation of IAS by conducting annual risk assessment (18 → 25 species)
    - Expanding risk assessment of alien pests, and designating invasive and migratory pests as ‘pest of prior great concern and eradication’ (40 → 100 species)
    - Establishing risk assessment framework for harmful introduced plants, and evaluating the grade for each species
  - Developing management technique of IAS and promoting the relief and eradication programs
    - Promoting researches and techniques to control alien species; development of various equipments and techniques capturing fish disturbing ecosystem, management of alien species in national parks, control techniques for forest pests and agricultural alien pests and



- measures to control invasive alien marine species
- Control programs for alien species or pathogens of primary concern such as nutria (*Myocastor coypus*), bullfrog (*Rana catesbeiana*), bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), burcucumber (*Sicyos angulatus*), and *Bursaphelenchus xylophilus* causing pine wilt disease
- ME gradually expands the budget to investigate and eradicate invasive alien species (1.5 billion KRW → 5 billion).

3. Safeguards for effective management of LMOs

- Improving management policy of LMOs
  - Promoting effective safety management based on ‘the 2nd Biosafety Management Plan of LMOs (2013–2017).
  - Boosting research, import/export, production, distribution and consumption through collaborative measures with other government agencies.
  - ‘Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety’ adopted in Oct. 2010, to be fully reflected. Coordination countering measures by analyzing the international trends, establishing implementation system.
- Safety management of LMOs
  - Improving risk assessment system for effective safety management of LMOs
  - Developing post management such as environmental effects evaluation
  - Developing screening technology of LMOs by gene analysis (33 → 60 items) and consistent monitoring system (the number of secured samples of presumed LMO, 626 → 700)
  - Mandatory reporting system of imported LMOs for researches and tests.
  - Establish safety and management system of LMOs for health and medicinal purpose

**Target and action 2014**

- Monitoring alien species disturbing the ecosystem and eradication of them in the national parks
- Eliminating of Moon jellyfish (*Aurelia aurita*)
- Establish safety and management system of LMOs for health and medicinal purpose

## 9. Biodiversity conservation system in response to climate change



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*Indicator: Expand designation of ‘pest of prior great concern and eradication’*

*Forecast change in species vulnerable to climate change*

*Develop new adaptive varieties to climate change (major crops)*

*Establish national arboretums for various climates and vegetation zones*

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### Current status

Climate change can cause the extinction of critical species as well as a huge impact in our environment. The changes in vegetation patterns, the loss of biological resources, sudden increase of southern alien species and changes in fishery resources are some of the major challenges the globe is facing. It is necessary to establish a long-term conservation plan in order to assess and monitor the effect climate change has on biodiversity, and respond to the fast changing situation in an efficient manner moving forward into the future.

### Outcomes from previous NBSAPs

- ✓ Conduction research on the selection and the management of indicator species for climate change
- ✓ Evaluating forest health and vitality
- ✓ Selecting and monitoring forest insect indicator for climate change
- ✓ Long-term monitoring of changes in forest ecosystem
- ✓ Predicting the future changes in the distribution and the diversity of species sensitive to climate change
- ✓ Enhancing the systematic management of species sensitive to climate change
- ✓ Expanding the exchange with microbial resource banks in the East-Asia region
- ✓ Expanding the establishment of national arboretums in various climate and vegetation zones
- ✓ Designating the forest protected areas such as forest swamps and

- ice valleys
- ✓ Developing new adaptive varieties to climate change

### Action plans 2014-2018

#### 1. Ecosystem monitoring system in response to climate change

- Monitoring the changes in species distribution
  - Operating Korea Biodiversity Observation Network to monitor species sensitive to climate change, increasing the target species up to 150 (currently 130 species designated)
  - Selecting and monitoring national forest species sensitive to climate change (100 species)
  - Collaborative investigation projects and monitoring network with affiliated national agencies to look out for the introduced species of primary importance
- Fostering the long-term monitoring project of ecosystem changes
  - Analyzing the effect of the climate change; the 2nd long-term ecology research project (2014–).
  - Establishment of the long-term ecology supersite for intensive monitoring (2018)
  - Agricultural species assessment including the populations of agricultural species sensitive to the climate change.

#### 2. Developing measures for adaptation to climate change to conserve biodiversity

- Developing forecasting system to detect changes of native species as part of Eco-Innovation run by ME
- Counteracting measures for adaptation to climate change
  - Implementing programs of transplantation at arboretums and botanical gardens as suggested in ‘The 2nd Arboretum Promotion Master Plan’
  - National arboretums to be established in different part of the country, Sejong City, Yanggu and Bongwha, to enhance the plants’ adaptation in different climate zones and vegetation zones.
  - Countering measures to be devised in response to invasive natural enemy of marine organisms.
  - Developing new cultivars of major crops including rice, barley, wheat, vegetable and grains that are adaptable to different climate (27 cultivars)

- Further enhancing cultivation technology of subtropical vegetables (5 species)

#### Target and action 2014

- Operate national management system of biological indicators for climate change
- Predict the change in future distribution of species sensitive to climate change and the change of biodiversity
- Practice diagnostic evaluation on forest health and vitality
- Continue to monitor the change of forest ecosystem for long term



Terraced paddy field at the southern part of Mt. Jirisan, by Seong Hyun Kim

## 10. Biodiversity evaluation and restoring effort



*Indicator: Develop national environmental map*

*Promote restoration of fragmented areas in core ecological belts in Baekdudaegan Mountain Range*

*Promote restoration of damaged areas of DMZ*

### Current status

The destruction of habitats caused by development and industrialization is the primary threat resulting in biodiversity loss. Given the high population density in Korea, the need for sustainable development for shelter and social advancement is extremely crucial. Although various environment conservation programs have been carried out nationally, there still prevail the conflicts between conservationists and those in favor of continuing economic development. Strengthening environment policies such as environmental impact assessment and discharge system for pollutants in order to minimize the effects on natural habitats, and promoting the integrated national plans for the restoration of ecosystems will be essential.

### Outcomes from previous NBSAPs

- ✓ Establishing the mid-/long-term roadmap for national environment map and developing methodology by preliminary studies
- ✓ Survey studies on 7 projects for future development such as industry and tourist facilities complex
- ✓ Establishing and promoting the action plan for ecological belt restoration
- ✓ Promoting the restoration programs for the ecological stream
- ✓ Restoring the key ecological belt of Baekdudaegan Mountain Range in national parks
- ✓ Implementing and monitoring the restoration project of tidal flats

### Action plans 2014-2018

1. The ME notified the legislation to expand the current 101 administrative



plans to 155 to strategically evaluate the effects on environment. This task can now be more efficiently carried out through the additional revision of Environmental Impact Assessment Act made on the 17th of September, 2013.

2. National environment maps such as ecological zoning maps to be further developed which will contribute to highly accurate analysis of current ecological status in Korea.

3. Ecological restoration effort allows all of the vital ecosystem belts to have a better connectivity.

- ‘Mid and long-term Promotion Plan for Restoration Programs of Ecological Rivers (2011–2015)’

- ‘National Ecosystem Restoration Plan’: In cabinet meeting on the 6th of Aug, 2013, Restoration Plan of Vital Ecosystem was reported.
- Establishing restoration strategies in reference to ‘Promoting Plan of Integrated Strategy for Natural environment Restoration (ME, Sept., 2007)’
- Creating guidelines for mountain range development and the use (in 2014)
- Restoration of the 50 fragmented areas in vital ecosystem belts by constructing ecological corridors, and monitoring 100 ha/year of damaged forests in Baekdudaegan Mountain Range and DMZ area

#### Target and action 2014

- Construct information infrastructure by mapping national environment
- Construct national ecosystem network
- Executing and monitoring restoration projects of tidal flats
- Restore damages in Baekdudaegan Mountain Range and DMZ areas





A pair of *Bufo gargarizans* in Mt. Chialksan, by Jeon Geun Lee

# PRIORITY FOR ACTION 4

- I. Mainstreaming Biodiversity
- II. Strengthening biodiversity conservation
- III. Reducing threatening elements of biodiversity

## IV. Sustainable use of ecosystem service

- V. Research and management mechanism of biodiversity
- VI. International collaboration on biological diversity

### 11. Biodiversity for agriculture, fishery and forest



*Indicator: Increase biodiversity in organic agriculture lands*

*Acquire useful forest plant resources*

#### Current Status

Agriculture and fishery, which have extremely high level of dependence on the ecosystem, require special measures to protect biological diversity. Environmental changes due to the loss of species and reduction of genetic diversity can bring catastrophic results. Due to degradation of traditional agriculture, the destruction of habitats and excessive inshore and coastal fishing, biodiversity essential for human livelihood has been threatened. The food security and sustainable use of biological resources must be executed through safe use of biodiversity, and excessive harvesting and over-fishing practice must be refrained.

#### Outcomes from previous NBSAPs

- ✓ Constructing biodiversity inventory in organic agricultural lands
- ✓ Developing organic agriculture technique for biodiversity conservation
- ✓ Strengthening the conservation policy of fishery biological resources

- ✓ Expanding ecological forestry practices through promoting forest care project according to 6 functions
- ✓ Strengthening the conservation of forest plant resources through developing arboretum and botanical gardens based on climate types or regional plant species
- ✓ Operating seed garden and developing mass propagating method for securing seeds of superior individuals

### Action plans 2014-2018

1. Eco-friendly agriculture practices
  - Data collection to accurately understand the soil condition, examining the boundaries of safe agricultural land use.
  - Eco-friendly agriculture practices and the introduction of natural enemy on biological diversity
2. Conservation of fishery stock, biological resources and marine recovery plans
  - Establishment of systematic approach to evaluate current marine ecosystem such as Total Allowable Catch system
  - Selection of restoration target species by promoting preventative measures for incidental catches of protected species
  - Expansion of fish cultivation projects
3. Protections of forest biological resources
  - Upgrading eco-friendly forestry practices, one of the major projects named 'Forest Care' is highly anticipated to bring about positive effect. It is with six categories: production of timber, retention capacity of water supply, conservation of living environment, forest recreation, and conservation of natural environment and prevention of mountainous disasters
  - Strengthened management of regional endemic plants and expanding Seed Collection Centers. Seed Collection Centers have been operated since 1968 at six locations in Korea. The centers produce and supply seeds of genetically excellent plant populations by inhibiting the introduction of foreign pollen grains to keep genetically excellent traits.





Reed marsh in Southern coast of Korea, by Hyun-Taek Lim

#### Target and action 2014

- Strengthen the conservation and management of fishery biological resources
- Establish specialized arboretums to better manage different climate types and vegetations
- Operate seed collection stations and proliferation centers of useful plants
- Re-doubling the measures to strengthen 'Forest Care' program which aims to developing eco-friendly practice.

## 12. Traditional knowledge on biological resources



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*Indicator: Expand investigation and research of traditional knowledge on native species*

*Build DB of traditional knowledge*

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### Current Status

To the present, projects on traditional knowledge have been carried out in several research institutes such as the Korean Intellectual Property Office. However, systematic management and streamlined research attempts have so far been insufficient. Korea is moving toward developing a nationally unified approach on the protection and use of traditional knowledge that are fully in line with the Nagoya Protocol.

### Outcomes from previous NBSAPs

- ✓ Re-interpretation of traditional knowledge by reviewing ‘*Done-eui-bo-gam*’, a literature on Korean traditional medicine
- ✓ Expanding the study of traditional knowledge on the native species
- ✓ Create the list and investigate the traditional knowledge of the ethnobotany in island areas
- ✓ Collecting and finding traditional knowledge recorded in ancient literature
- ✓ Finding traditional knowledge of agricultural biological resources
- ✓ Developing DB service of traditional knowledge on oriental herbal medicine
- ✓ Constructing DB of traditional knowledge on folk medicine
- ✓ Promote professional level dialogue on traditional knowledge about biological resources
- ✓ Constructing DB of traditional knowledge on native species
- ✓ Exploring the traditional knowledge on marine species
- ✓ Nationwide survey of traditional plant resources and constructing DB
- ✓ Constructing the foundation for protecting traditional knowledge and intellectual property rights

- ✓ Exploring high-value resource plants based on traditional knowledge
- ✓ Constructing collection, proliferation and conservation system of plant resources using traditional knowledge
- ✓ Developing cultural contents using traditional knowledge on biological resources

## Action Plans 2014-2018

### 1. In-depth research on Korean traditional medicine

- Further investigations on traditional knowledge on endemic species, completing the representative list of traditional knowledge through the national agriculture and fishery heritage system
- The collection of traditional knowledge on agricultural biological resources orally transmitted or recorded in the ancient literature up to 600 items (currently 250 items).
- Further investigation of traditional knowledge on marine biological resources to be conducted (100 findings).
- Compiling a new Manual of Oriental Medicine, called '*Dong-eui-bo-gam*' in Korean, by reviewing the traditional knowledge on Korean Traditional Medicine for 2012–2017. *Dong-eui-bo-gam* was also enlisted in UNESCO Memory of World in 2009.
- 'Experts forum on the traditional knowledge and biological resources' composed of experts in related organizations. This forum was initially established in 2012, has held 4 times a year.

### 2. Establishing mid to long-term plan to conserve traditional knowledge

- Establishing strategies for three key fields in traditional knowledge (i.e., discovery/research/protection, construction of collection and management system, and establishment the foundation for the application) according to the Act on the Conservation and the Use of Biological Diversity<sup>9</sup>
- Building verification system and DB of information on traditional knowledge
- Establishing the international protection platform of traditional knowledge
  - \* Developing intellectual property right of traditional knowledge so that it can be internationally acknowledged. Moreover, Korea Traditional Knowledge Portal by Korean Intellectual Property Office provides services in English as well as in Korean for better access by global



citizens.

### 3. High value of traditional knowledge

- Distribution of techniques and contents for the modern applications of traditional knowledge
- Appointing 100 traditional species of high value and 100 pieces of traditional knowledge on biological resources of which application to agricultural field is verified (2015–)
- Fostering Bio-industrial field with the application of genetic resources based on traditional knowledge

#### Target and action 2014

- Expand studies and exploration of traditional knowledge in endemic species, agriculture and fisheries, and Korean traditional medicine
- Further develop DB service of traditional knowledge on herbal medicines
- Expand researches in traditional knowledge on endemic species towards building the mid/long term trajectory
- Build DB and protection foundation of traditional knowledge on marine biological and forest resources
- Develop cultural contents by the application of traditional knowledge on biological resources
- Research on the exploration of traditional knowledge in agricultural biological resources

Priority 1

Priority 2

Priority 3

Priority 4

Priority 5

Priority 6

## 13. Optimizing ecosystem service



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*Indicator: Expand the designation of ecotourism areas*

*Restoring forests in traditional towns*

*Expand eco sharing project for vulnerable class of society*

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### Current Status

In Korea, like other countries, ecosystem service has decreased due to the overuse of natural resources. The national efforts to evaluate and integrate the value of ecosystem service have been lacking, which generates the need to foster the industries related to ecosystem with high priority; supporting to make right decisions on investments based on evaluation of the right value of ecosystem service, improving the function of the environment regulating services in the urban areas of high population, and executing ecotourism by making good use of cultural service.

### Outcomes from previous NBSAPs

- ✓ Exploring and evaluating the ecosystem service of urban forest
- ✓ Establishing various types of biological habitats in the urban areas
- ✓ Increasing supports for tidal flat ecological park, tidal flat eco-center and visiting routes of tidal flat
- ✓ Constructing green network by establishing forest in the urban areas
- ✓ Restoring traditional village forest for the restoration of ecological function and recreation of forest landscape
- ✓ Designating and promoting eco-tourism areas (in collaboration with MCST)
- ✓ Developing tourism resource from ecological resource such as wildflowers
- ✓ Promoting 'Eco-sharing project'
- ✓ Expanding forest healing facilities, constructing forest reaction space and developing tourism resource with endemic wildflowers.

## Action Plans 2014-2018

1. Evaluation system of ecosystem service value in support of making decision on development plan
  - Platform to evaluate the value of ecosystem service
    - Classification system and basic data system to support the accurate evaluation of ecosystem service value.
    - Evaluation analysis to be applied in development in policy making procedures, which will eventually connect ecosystem, society and economy
  
2. Enhancing biodiversity in urban areas
  - Conservation measure of urban biodiversity
    - Eco-city map development through biodiversity survey led by local governments and eco-city map
    - Conducting comprehensive research on the ecosystem service in urban residential areas
    - Building green network in urban area such as urban forest and continuing support for restoration project
  
3. Fostering eco-tourism in collaboration with government agencies and providing support in farming and fishing villages with excellent ecosystem zone
  - By expanding the collaboration eco-tourism system between ME and MCST in 2013, the Korean government is aiming for a pan-society promotion system for ecotourism. With the participation of related government agencies, public institutions such as KNPS and KTO, local residents and regional governments, more systematic approach will be made.
  - Expanding of ecotour areas from 12 sites to 30 sites, and enlarging the ecotour resource of ME and MCST. Ecotour invigorating policy, monitoring of eco-tour resources, operating joint award system of ecotour every year, certificating ecotour guides (rearing 200 guides), constructing the integrated ecotour information system, etc, will also be set up.
  - Eco-sharing Project such as offering ecotour vouchers for vulnerable social group (38,000 persons cumulative by 2012 → 160,000 persons cumulative by 2018)
  - Promoting Eco-/Farming tourism Complex Model Projects in collaboration between ME and MAFRA (5 sites to be designated in 2014)
  - Developing assessment indicators of sustainable ecotourism in

reflection of ecological capacity from 2014.

#### Target and action 2014

- Construct systematic evaluation system of the ecosystem service values evaluation
- Further enlarge facilities and infrastructure for the National Parks
- Restoration projects in natural grounds, ecological playgrounds and damages areas
- Develop proliferation techniques of wild flowers to boost the forest ecosystems

Spring time in Yeongsangang (River), by Yong Ki Kim







Priority 1

Priority 2

Priority 3

Priority 4

Priority 5

Priority 6

# PRIORITY FOR ACTION 5

- I. Mainstreaming Biodiversity
- II. Strengthening biodiversity conservation
- III. Reducing threatening elements of biodiversity
- IV. Sustainable use of ecosystem service

## V. Research and management mechanism of biodiversity

- VI. International collaboration on biological diversity

### 14. Evaluating and monitoring biodiversity



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*Indicator: Construct species list of Korea*

*Collect biological specimens*

*Revise ecological zoning maps*

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#### Current Status

Since the evaluation and the monitoring of biodiversity are the basic tools for the conservation and management of biodiversity, the results of a wide range of biodiversity surveys have been used as evaluation measures for ecological zoning maps and conservation policy making in Korea. The number of native species in Korea is reported to be over 41,483, and the surveys and studies on biodiversity have been actively pursued, targeting 60,000 native species to be accurately recorded by 2020. Changes in domestic biodiversity should be monitored regularly, which will be used for the establishment of conservation plan.

Several national research projects in place include Survey on Current Inhabitation of Wild Animals (1967–), National Natural Environment Survey (1986–), National Distribution Survey of Endangered Wildlife (2001–) and



Survey of Native Species (2006–).

### Outcomes from previous NBSAPs

- ✓ Expanding the national list of biological species
- ✓ Basic investigation on marine ecological belts in national parks
- ✓ Mapping habitats of marine species, and surveying and monitoring natural resources in national parks
- ✓ Surveying and updating species list of marine biological resources
- ✓ Surveying native plant species and establishing the national standard plant list
- ✓ Surveying forest insects in Korea
- ✓ Surveying diversity of lichens and mushrooms in Korean forests
- ✓ Activating public participation in biodiversity survey and monitoring
- ✓ Mapping ecological resources in national parks
- ✓ Establishing the distribution map of Korean plants

### Action plans 2014-2018

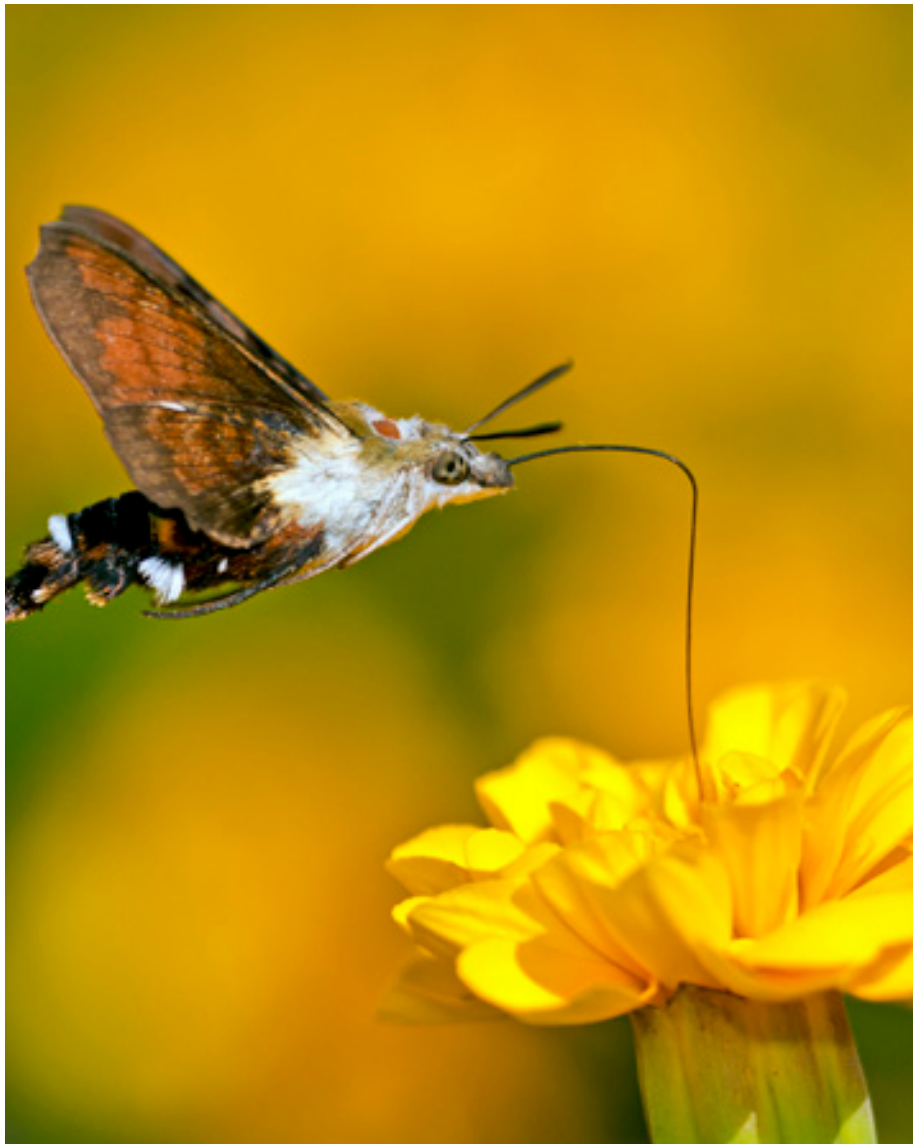
#### 1. Completion of the national list of biodiversity

- Increasing the number of designated indigenous species, currently 41,483 species reported by the end of 2013, to 50,000 by 2018 and 60,000 by 2020 through the survey of terrestrial native species
- Building survey system of in-shore marine biological resources
- Revising the national list of species.
- The publication of Korean biota which includes integrated biological information on each taxon through the comprehensive studies on native species.
- Completion of the research projects such as the 4th National Nature Environment Survey (2013–2017), National Inland Wetland Survey (annually), the 7th National Forest Resource Survey (2016–2020), the 1st Marine Biological Resource Survey (2014–2018), Marine Ecosystem Survey (2006– ), Coastal Wetland Survey (1999– ), Monitoring on Marine Protected Areas (2011– ), Marine Biodiversity Survey (2006–), Marine Fishery Resource Survey (annually), Agriculture Ecosystem Biota Survey (annually), Joint Survey of National Biodiversity Institutes (annually), etc.

- Collecting biological specimens; 2.34 million terrestrial specimens to be increased up to 2.74 million and 0.46 million marine specimens to become 0.80 million
2. Advanced research centers for each types of ecosystem such as terrestrial, freshwater, coast, etc. by location feasibility study in 2014
- ‘Mid and long-term Action Plan of Ecological Researches (2014–2020)’
- Promoting ecological research plan for 6 areas: basic ecological study, ecological evaluation analysis, climate ecology study, ecological damage study, etc.
3. Expanding the participation of regional experts and civilians in biodiversity research
- The public participation in ecological surveys by designating small-scale ecology observation sites in schools, parks, etc., and developing web programs for civilian observation
  - In 2013, 49 sites are in operation, and gradual expansion is in progress
  - Operating KBON with local environment experts and local residents who are familiar with regional biodiversity. Currently, the number of participating organizations is 18 with the aim to increase to 25 by 2018
4. Constructing Korea Biodiversity Information Map
- Constructing ecological zoning maps on the basis of biodiversity survey
- Regular revision of the ecological zoning map so that it can be effectively applied to the city planning and development projects
  - Marine ecological maps are designed and officially notified, further application of the maps in various marine ecosystem survey programs
  - These maps are to become fully available for the public.
  - Distribution map of Korean plants, map of current states of urban ecosystem, ecological

### Target and action 2014

- Further expand the national list of biodiversity species of Korea to lay the foundation for its sustainable use
- Enhance public participation in biodiversity survey
- Survey and study natural resources of national parks
- Develop ecological resources in national parks and marine ecosystem map
- Construct plant distribution map in Korean peninsula
- Notifying marine ecological maps



*Macroglossum pyrrhosticta* by Dae Heung Kang

## 15. Capacity building in biodiversity management



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*Indicator: Expand KBIF network*

*Expand biodiversity research institutes*

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### Current Status

Korean government is fully recognizing the importance of developing techniques and training professional manpower to achieve the conservation and sustainable use of biodiversity. By establishing NIBR in 2007 and National Ecology Institute (NEI) in 2013, the information sharing system as well as the workforce training has seen significant improvements. The dependence on some of biological resources such as agriculture, health and medical care, and forest resource is quite high in Korea compared to low level of existence of biological resources.

### Outcomes from previous NBSAPs

- ✓ Establishing the regional institute of biological resources
- ✓ Constructing national restoration center for endangered species
- ✓ Establishing Marine Biodiversity Institute of Korea
- ✓ Designating and operating forest biological resource management centers, and increasing forest research institutes
- ✓ Enhancing Korean National Research Information System (NARIS)
- ✓ Promoting technique development to support the conservation and management policy on biodiversity
- ✓ Improving the National Biodiversity Information Sharing Mechanism (<http://www.kbr.go.kr>) based on linked open data (LOD)
- ✓ Enhancing the Korea Biodiversity Information System (<http://www.nature.go.kr>)
- ✓ Supports the pool of professionals for research and management of biodiversity
- ✓ Raising professionals for unstudied taxa
- ✓ Training professionals for gardeners and arboretum coordinators
- ✓ Designating education centers for forest insect industry

## Action plans 2014-2018

### 1. National biodiversity research institutes

- Promoting the establishment of national biodiversity research institute
  - MABIK and National Institute of Nakdonggang (River) Biological Resources, and Baekdudaegan Arboretum to be established in 2014 and 2016, respectively.
  - Central Arboretum and research institutes in other regions (Honam, Gangwon, and Jeju)
  - Effective management through clearly separating the roles and functions of each institutes
  - Research activities at national level also have been nurtured with the Operating National Information Center of the Bio-resource for Research established in 2013 and National Conservation and Management Center of Natural History established in 2011.
- Fully functioning conservation facilities for biological resources
  - Expanding the establishment and operation of biological resource center and competent authority of the bio-resource for research according to Act on Acquisition, Management, Utilization of the Bio-resource for Research
  - \* Designating and managing biological resource conservation facilities, *ex situ* conservation institutes and wildlife rescue centers under ME, and national, public and private arboretums under KFS as the deposit registration conservation agency (2014–), Expanding network of KBIF (46 organizations to 50)

### 2. Expanding research development for the conservation of biodiversity

- Vitalizing collection and search of endemic biological resource
  - Expanding analyses of genetic information on biological resources through comparative analyses of genetic characters
  - Development of DNA markers of endemic biological resource to in 2014, introduction of genetic barcode system for marine organisms in 2015, and the application of genomic analysis technology such as NGS in 2014.
- Comprehensive evaluation of the information of biological resources
  - Evaluating characteristics of agricultural genetic resources
  - ‘Certification System of Biological Resource’ to be established in 2015. Wide range of information will be provided for the system including

scientific names, distribution and habitat status

- Promoting to develop technology related to useful organisms in charge of each government agency
- Expanding the linkage among Korean Bio-resource Information Service (KOBIS, [www.kobis.re.kr](http://www.kobis.re.kr)), Korean Biodiversity Information Facility (KBIF, [www.naris.go.kr](http://www.naris.go.kr)), Bio Resource Information Service (BRIS, [www.bris.go.kr](http://www.bris.go.kr)), National Biodiversity Information Sharing Mechanism (KBR, [www.kbr.go.kr](http://www.kbr.go.kr)) and Marine Bio Resource Information Service (MBRIS, [www.mbris.kr](http://www.mbris.kr)), and information systems of biological resource of related government agencies, local governments and private sectors

### 3. Training professional manpower

- Raising masters and Ph.D.'s for biodiversity researches
  - Through 'Professional Manpower Training Program for Unstudied Taxa (2012–2021)', the education of academic professional manpower for unstudied taxa or taxa will be conducted with the aim to have at least 100 masters or Ph.D.' qualified professionals trained.
  - Training professionals for analyses of ecosystem service. Between 2014 and 2021, 60 students are expected to complete either master's degree or Ph.D.'s.
  - Training professionals for the conservation and the sustainable use of biodiversity for biodiversity survey (40), arboretum gardeners and forest insect industry

#### Target and action 2014

- Continue to enhance NARIS
- Enhance information sharing system of national biodiversity
- Continue to establish Regional Institute of Biological Resources, and develop effective operational system
- Constructing the national list of native species through research and investigation project
- Continue to raise professional manpower for biodiversity
- Establish National Institute of Marine Resources
- Expand national knowledge information system of biological species
- Training professionals for arboretum gardeners and coordinators



## 16. Mechanisms for the access and benefit sharing of genetic resources



*Indicator: Complete implementation and ratification system of the Nagoya protocol*

*Expand registration of genetic resources for national management*

*Expand designation of biological resources subjected to the permission for export*

### Current Status

Korea has established a pan-government measure for the Nagoya Protocol in 2011 and has been pursuing implementation legislation to rectify the Protocol. It is also necessary to provide information and to improve awareness among stakeholders such as government agencies and private sector for the implementation of the access and benefit sharing. Reshaping the national legislation on the access to genetic resources and equitable benefit sharing seems to be a crucial task for the country. Establishing genetic resource information system to promote foreign parties to gain an access to Korean genetic resources holds significant importance as well.

### Outcomes from previous NBSAPs

- ✓ Establishing the pan-ministerial system for the Nagoya Protocol
- ✓ Amending the domestic acts related to the implementation of ABS
- ✓ Analyzing the Nagoya Protocol and enhancing public awareness
- ✓ Promoting the legislation acts on pathogen resources
- ✓ Promoting the legislation of ‘Act on the Access to Genetic Resources and Benefit Sharing’
- ✓ Case studies and development of standard model of benefit sharing
- ✓ Operating Korean Bioinformation Service (KOBIS)
- ✓ Building integrated DB of agricultural biological resource
- ✓ Designating biological species subjected to the permission of export
- ✓ Operating the information system of marine biological resources
- ✓ Collecting and evaluating forest biological resources for their sustainable

use

- ✓ Building information DB to enhance the use of forest biological resources

### Action plans 2014-2018

#### 1. Measures for the access to genetic resources and benefit sharing

- Enactment of ‘Act on the Access to Genetic Resources and Benefit Sharing (tentative)’ for rectification and implementation of the Nagoya Protocol
  - Preparing detailed regulations and enforcement decrees on principles of access to genetic resources and benefit sharing, compliance of duties, designation of related agencies, etc.
- Consolidating acts related to genetic resources in relevant ministries such as MSIP, MAFRA, MOHW and MOF
- Strengthening the awareness of stakeholders to comply with the implementation of ABS
  - Promoting information sharing mechanism for the access to genetic resources and benefits sharing (2015)
  - Investigating cases of benefit sharing and developing the standard model
  - Expanding the provision of information with the help of the Nagoya Protocol help desk (from 8 cases in 2012 to 20 in 2014) and holding ‘Korea ABS Forum’ regularly 3 times per year, which is composed of experts from academic, industrial and legal experts.

#### 2. Expanding and linking existing biodiversity database

- ME: Expanding to share information based on the national sharing mechanism of biodiversity information, from 1.2 million cases to 2 million
- MOF: Operating marine bio-resource information system, starting from 2014
- KFS: Expanding national biological species knowledge information system from 4.12 million to 4.2 million
- MSIP: Expanding national integrated system of information on the bio-resource for research (1.62 million data to 1.7 million), and operating inventory of natural history resource and national integrated information system of natural history research
- MOHW: Building total information management system of pathogens
- MAFRA: Expanding integrated information system of agro-biological

- resources from 11,147 data to 14,150
- RDA: Building DB of useful traits of agricultural genetic resources (70,000 data/yr)
- Establishing management system for genetic resources with high economic value
  - Registering traditional stocks and breeding genetic resources of conservative needs in national system, and strengthening their management to prepare for the claims from the countries of origin. Nationally managed registration system are also forecasted to be expanding from 65,000 cases to 85,000, increasing deposition of native strains, wild species and endemic species. The compulsory national management registration and conservation of breeding varieties and parental stocks are also to be further cultivated.
  - Protecting genetic resources of ecological and economic importance using strengthened management such as export permission of biological resources from 1,971 species to 4,300 species
  - Obligatory prior approval for export of biological resource in place in an effort to regulate marine bio-resource and fishery bio-resource
  - Encouraging deposition of species information and specimens owned by individuals and private organizations to the biological resource center according to Act on Acquisition, Management, Utilization of the Bio-resource for Research

**Target and action 2014**

- Build integrated DB of agricultural bio-resources
- Further strengthen the national capability to systematically roll-out ABS system
- Secure sovereign power on native species
- Select species subjected to the permission for export
- Standardize information and build the integrative DB of marine biological resources
- Increase the cooperation between relevant ministries and develop a domestic model for ABS

# PRIORITY FOR ACTION 6

- I. Mainstreaming Biodiversity
- II. Strengthening biodiversity conservation
- III. Reducing threatening elements of biodiversity
- IV. Sustainable use of ecosystem service
- V. Research and management mechanism of biodiversity

## VI. International collaboration on biological diversity

### 17. Cooperation between South and North Korea



*Indicator: Promote monitoring current status and changes in ecosystems of DMZ area*

#### Current Status

Since diverse plant and animal resources inhabit in the Korean Peninsula, the collaboration between South and North Korea holds inevitable significance for the conservation and sustainable use of biodiversity. Especially, DMZ, as one of three core eco-belts in Korea, attracts attention globally as the symbol for the peace and biodiversity.

Currently, comprehensive data collection will be useful for biodiversity cooperation between two Koreas. It is reported that forests have been largely damaged in North Korea due to rapid deforest activities.

#### Outcomes from previous NBSAPs

- ✓ Monitoring current status and changes of the ecosystem in DMZ area

#### Action plans 2014-2018

1. Exploring joint collaboration tasks

- Establishing the platform, where feasible, to promote the collaboration between South and North Korea by examining current biodiversity status, management and use of biological resources in North Korea
- Generating research projects between South and North Korea in the dimension of ‘Green Détente’ and DMZ, if feasible.

2. Raising the public involvement and awareness in DMZ

- Sustainable use of ecological and environmental resources of DMZ for regional and communal development
- Organizing international conference to draw more attention at home and abroad
- Developing education programs for strengthening the participation of various local members
- Strengthening DMZ related R&D programs

**Target and action 2014**

- Further monitor the current status of ecosystem in transboundary area and in DMZ area.



Flocking of birds, by Sung Kyu Choi



## 18. Enhancing international collaboration for biological activity



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*Indicator: Hosting COP12*

*Expand funds to developing countries*

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### Current Status

Korea is actively participating in international activities for the conservation of biodiversity by maintaining close relationships with other countries and relevant organizations for multilateral agreements such as CBD, Ramsar Convention, UNCCD, etc. as well as regional collaborations with the countries of the East Asia. Korea is also strengthening international partnership through multilateral discussions on biodiversity with international organizations, regional cooperation of Northeast Asia, forest resource cooperation, etc. By hosting COP10 of Ramsar convention and COP10 of UNCCD in 2008 and 2011, respectively, and CBD COP12 in 2014, Korea is emerging as a strong partner for multilateral agreements.

Recently, Korea is seeking out to share the experience and knowhow of economic growth with developing countries. It is largely in response to the request of expanding ODA with the recent participation in OECD DAC in 2010. Biodiversity issues must be considered at both global and national level through the implementation of international agreements to further enhance effective international partnerships.

### Outcomes from previous NBSAPs

- ✓ Strengthening the implementation of international cooperation related to biodiversity
- ✓ Collaborative survey on biodiversity of foreign countries and building cooperation systems
- ✓ Enhancing effective implementation on GTI and GSPC, and promoting international contributions
- ✓ Strengthening the international cooperation on the restoration of forest landscape

- ✓ Building ‘Pan-Asia Forest Traditional Knowledge Network’
- ✓ Agreement on the letter of intent to constitute ‘East Asia Forest Biodiversity Network’
- ✓ Establishing the master plan to support the follow-up programs of CBD COP12
- ✓ Expanding science and technology cooperation with developing countries

### Action plans 2014-2018

#### 1. Implementation of international agreements on biodiversity

- Complying with obligations as a contracted party of multilateral agreements
  - Demonstrating the features of national biodiversity report for CBD, CITES, Ramsar, WHC, etc. and presenting implementation measures effectively
  - Building a system for regular monitoring of implementation status for multilateral agreements at national level
- Supporting international implementation in multilateral agreements
  - Not only continuing active participation in UNEP, UNDP, CBD, CITES and Ramsar but also strengthening the response to multilateral discussions through international organization by implementing resolutions and recommendations adopted 2012 IUCN WCC held in Jeju, etc.
  - Participating actively to the discussions on international scientific platform such as IPBES, GBIF, DIVERSITAS, etc.
  - Continuing active participation in multilateral collaboration programs such as GTI, GSPC, GEOBON, etc.
- Regional collaboration for biodiversity conservation
  - Continuing the discussion on conservation at regional level through Three Environment Ministers Meeting among Korea, China and Japan (TEMM) and Tripartite Policy Dialogue on Biodiversity annually
  - Strengthening international stance for the initiatives hosted in Korea such as NOWPAP, EAAFP, etc.

#### 2. Hosting successful CBD COP12 and efficient follow-ups

- The need of the international roadmap to enhance implementation of the Strategic Plan 2011-2020; ‘Pyeongchang Roadmap’ of COP12 should generate momentum for the achievement of the Global Biodiversity Targets. For this, Korea proposes to agree on a ‘Pyeongchang Roadmap’: a series of concrete actions and initiatives necessary to ensure that parties achieve the

Aichi Targets by 2020. As the host country and incoming presidency, Korea will make an effort for parties to come up with the roadmap supported by the concrete initiatives and partnership to accelerate and guide the implementation of the Strategic Plan for Biodiversity 2011-2020.

- Pyeongchang Ministerial Declaration on Biodiversity and Sustainable Development

- How to mainstream biodiversity into the sustainable development plans and programs is the key mission for biodiversity community to achieve the Convention's objective. In this vein COP12 will also come at a critical time in the development of the post-2015 development agenda. Discussions on setting new development agenda and Sustainable Development Goals will be getting underway at the same time. Korea views that COP12, and the associated High Level Segment will be an important opportunity for Ministers to transmit a message to the UN General Assembly on the importance of biodiversity for the post-2015 development agenda and the need for biodiversity, including the Global Biodiversity Targets, to be integrated into the SDG framework.

- 'Bio-Bridge Initiative' as the follow-up action to support CBD COP12 outcomes.

- Korean Government is fully supporting the 'Bio-Bridge Initiative' to support the actions contained in the 'Pyeongchang Roadmap'.
- Korea also wishes to highlight how biodiversity can contribute to solutions to many of society's sustainable development challenges and this aligns nicely with Korea's call for Creative Economy.

3. Expanding supports and collaboration programs for developing countries

- Increasing the amount of financial assistance for developing countries; the Korean government is planning to double the subsidy amount by 2015, with no immediate reduction until 2020
- Expanding science and technology collaboration programs with neighboring nations in Southeast Asia

#### Target and action 2014

- As a hosting nation of COP12, the international cooperation will be further strengthened in various multilateral agreements.

- Continue following up measures of World Conservation Congress
- Expand ODA for conservation
- Establish the foundation for building East Asia marine protected area network
- Strengthen the international collaboration for the restoration of forest landscape
- Build 'Pan Asia Forest National Traditional Knowledge Network' and 'East Asia Forest Biodiversity Network'

Priority 1

Priority 2

Priority 3

Priority 4

Priority 5

Priority 6

*Ciconia nigra* by Seong Won Lee



# Aichi biodiversity Target

PRIORITIES FOR ACTION		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Mainstreaming Biodiversity	Strengthening the foundation to execute biodiversity policies																					
	Raising public awareness and participation																					
	Expanding the budget																					
Strengthening biodiversity conservation	Protection and management of wildlife																					
	Protecting species of major importance																					
	Expansion and efficient management of protected areas																					
	Conservation of genetic diversity																					
Reducing threatening elements of biodiversity	Safeguard for alien species and LMOs																					
	Establishing conservation system of biodiversity in respond to climate change																					
	Biodiversity evaluation and restoring efforts																					
Sustainable use of ecosystem service	Biodiversity for agriculture, fishery and forest																					
	Traditional knowledge on biological resources																					
	Optimizing ecosystem services																					
Research and management mechanism of biodiversity	Evaluating and monitoring biodiversity																					
	Capacity building in biodiversity management																					
	Mechanism for the access and benefit sharing of genetic resource																					
International collaboration on biological diversity	Cooperation between South and North Korea																					
	Enhancing international collaboration for biological diversity																					

\* Related to overall vision of the Convention for the conservation of biodiversity

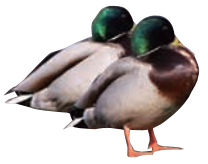


# ACRONYMS

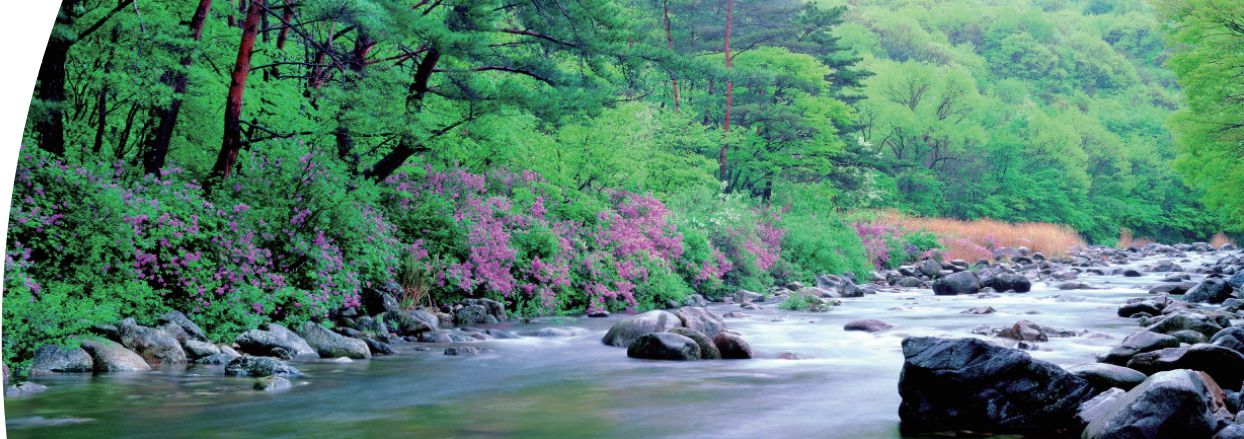
ABS	Access and Benefit-sharing
BRIS	Bio-resource Information Sharing
CBD	Convention on Biological Diversity
CHA	Cultural Heritage Administration
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of the Parties
DAC	Development Assistance Committee
DMZ	Demilitarized Zone
FAO	Food and Agriculture Organization of the United Nations
GBIF	Global Biodiversity Information Facility
GEOBON	Group on Earth Observations Biodiversity Observation Network
GSPC	Global Strategy for Plant Conservation
GTI	Global Taxonomy Initiative
IAS	Invasive Alien Species
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for Conservation of Nature
KBIF	Korean Biodiversity Information Facility
KBIO	Korean Biotechnology Industry Organization
KBON	Korea Biodiversity Observation Network
KBR	Korean Biological Resources
KEI	Korea Environment Institute
KFS	Korea Forest Service
KNPS	Korea National Park Service
KOBIS	Korean BioInformation Service
KRW	Korean Won
KTO	Korea Tourism Organization

LMO	Living Modified Organism
LOD	Linked open data
MABIK	Marine Biodiversity Institute of Korea
MAFRA	Ministry of Agriculture, Food and Rural Affairs
MCST	Ministry of Culture, Sports and Tourism
ME	Ministry of Environment
MOF	Ministry of Oceans and Fisheries
MOLIT	Ministry of Land, Infrastructure, and Transport
MOTIE	Ministry of Trade, Industry and Energy
MSIP	Ministry of Science, ICT and Future Planning
NARIS	Korean National Research Information System
NBSAP	National Biodiversity Strategy and Action Plan
NEI	National Ecology Institute
NIBR	National Institute of Biological Resources
NIER	National Institute of Environmental Research
NIMR	National Institute of Meteorological Research
NLTER	National Long-Term Ecological Research
NRCS	National Research Council for Economics, Humanities and Social Science
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
RDA	Rural Development Administration
ROK	Republic of Korea
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SCICOLL	Scientific Collections International
TEMM	The Tripartite Environment Ministers Meeting among China, Japan, and Korea
UN	United Nations
UNCCD	UN Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WCC	World Conservation Congress





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Republic of Korea



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